

SAA Project Update December 1, 2022

During this reporting period we initiated the trial with the first diet series when the yellowtail reached 5g but the fish did not accept the diets, even the fish meal control. We tried several methods to wean the fish onto the experimental diets, including mixing the experimental feeds with a commercial diet at 50:50, and top-coating the experimental diets with fish oil or krill oil. None of these approaches yielded adequate feeding responses.

Dr. Davis reformulated the diets to include 10% fish meal and we tried again – this time successfully (see Table 1). By this time, the fish were 16g each on average. Out of curiosity, we tested the old diets on subgroups of fish held separately from the main experiment. These fish were presented original diets #4 and #6 (fish meal control) and they consumed them readily. This suggests that the size of fish plays an important role in diet acceptability, which is an important consideration for future research.

**Table 1.** Diet formulations for six treatments fed to replicate groups of yellowtail starting at 16g.

Ingredient	Treatment					
	1	2	3	4	5	6
Menhaden fishmeal	100.0	100.0	100.0	100.0	100.0	300.0
Poultry meal from AU	200.0	200.0	200.0	200.0	200.0	238.0
SE Soybean meal - from poultry	344.0	172.0	172.0			
SBM Bright Day -Benson Hill		144.0		289.0		
SBM Hamlet HP 300			139.0		279.0	
CPC - Empareal 75	80.0	80.0	80.0	80.0	80.0	80.0
Menhaden fish oil	60.7	61.1	59.3	61.6	57.8	38.7
Corn Starch	0.4	26.0	32.8	52.5	66.3	152.8
Whole wheat	173.0	175.0	175.0	175.0	175.0	175.0
Mineral premix (ASA/marine fish)	2.5	2.5	2.5	2.5	2.5	2.5
Vitamin premix (ASA/marine fish)	5.0	5.0	5.0	5.0	5.0	5.0
Choline chloride (0.2% all diets)	2.0	2.0	2.0	2.0	2.0	2.0
Rovimix Stay-C 35%	1.0	1.0	1.0	1.0	1.0	1.0
CaP-dibasic	25.0	25.0	25.0	25.0	25.0	
Methionine	1.4	1.4	1.4	1.4	1.4	
Taurine	5.0	5.0	5.0	5.0	5.0	5.0
Total	1000.0	1000.0	1000.0	1000.0	1000.0	1000.0

The trial was successfully run for eight weeks during which time the fish grew to a maximum average of 141g (Table 2). Survival was high among all treatments and FCRs were generally low. There were no statistical differences among treatments for any performance measurement.

**Table 2.** Summary statistics for final growth, FCR and survival among California yellowtail fed six dietary treatments for 8 weeks.

Treatment Diet	Final Weight (g ± SD)	Weight Gain (% ± SD)	FCR (mean ± SD)	Survival (mean ± SD)
1	135.45 ± 7.14	722.62 ± 43.33	1.16 ± 0.02	100
2	141.31 ± 5.11	755.61 ± 32.09	1.13 ± 0.03	96.7 ± 6.7
3	139.00 ± 6.01	742.42 ± 36.13	1.14 ± 0.05	100
4	137.56 ± 3.77	731.18 ± 20.91	1.16 ± 0.11	100
5	133.50 ± 3.05	705.84 ± 18.66	1.13 ± 0.03	100
6	141.08 ± 4.52	753.41 ± 30.38	1.11 ± 0.03	100

Tissue samples were collected for biochemical analysis, liver and gut histology, as well as gene expression in the hind gut. Results are pending.

